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# Plant Health Technology National Programs

Integrated Pest Management and  
Eradication



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## Who We Are

The Plant Protection and Quarantine (PPQ) branch of the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) uses integrated pest management (IPM) strategies to maximize pest control while minimizing adverse effects on the environment, producers, and consumers. Eradication is the goal for pests or diseases that pose significant risk and that are limited in distribution. Population suppression is the goal for such threats that are already widely distributed in the United States.

The mission of the Center for Plant Health Science and Technology's (CPHST) Integrated Pest Management and Eradication (IPME) Program is to provide scientific support to PPQ's regulatory program managers and decisionmakers engaged in strategic planning and deployment of programs. These programs are designed to safeguard America's crops and environment from adverse impacts caused by insects and other arthropods, nematodes, and weed pests, and by diseases of regulatory significance.



*The emerald ash borer attacks all species of ash except the mountain ash. CPHST staff are working with other scientists to eradicate this foreign pest from the United States.*

IPME's vision is to harness technology required to ensure that APHIS PPQ routinely delivers programs that effectively minimize risks associated with insects, weeds, diseases, and nematodes of regulatory importance.

## What We Do

IPME scientists evaluate technologies for their potential to improve APHIS-PPQ management or eradication programs for exotic pests and diseases. Program activities include

- Supporting suppression of plant pests and pathogens through development of offshore management and scouting programs.
- Providing technical support for the mass-rearing of biological control agents and sterile insects.
- Designing baits, lures, and traps to quantify and reduce population densities.
- Enhancing the viability and vitality of sterile insects and biocontrol agents.
- Supporting suppression of widespread insect and weed infestations using biocontrol.



*The Japanese beetle, *Popillia japonica*, spends most of the year underground as a grub. But adults emerge in late spring to feast on dozens of popular shrubs and flowers, especially east of the Mississippi. Biological control methods for dealing with this beetle are described in an APHIS brochure posted on the Web at <<http://www.aphis.usda.gov/oa/pubs/jbbro.pdf>>.*

- Supporting control of insects and diseases by enhancing host resistance.
- Monitoring efficacy of IPM and eradication programs.
- Evaluating insecticides, herbicides, nematicides, and fungicides and application technology to enhance program efficacy while minimizing the amount of agrichemicals required for effective pest management.
- Disinfesting facilities, equipment, watering systems for eradication and management programs.



*The brown spots on the leaves of this mountain laurel (Kalmia sp.) indicate the presence of sudden oak death. This recently arrived fungal disease can affect dozens of species of trees and nursery plants.*



## Where We Are Going

The adaptation and adoption of improved technologies so that APHIS–PPQ can meet its goals is a primary function of the IPME Program. Its investigators perform research at CPHST laboratories throughout the United States. Some projects are conducted in foreign countries where pests and diseases invasive to the United States occur naturally.



*Emerald ash borer galleries. Dead wood extends above the area of tunnelling.*



CPHST scientists use a wide array of technologies and approaches to evaluate elements that contribute to the success of APHIS PPQ programs. CPHST evaluates and validates tools that may be used in eradication and management programs. When effective options are lacking, CPHST works independently and collaboratively with scientific experts to develop components required to enable APHIS PPQ to deliver safe, effective, and practical management or eradication programs for pests and diseases.



*Nematodes are small, round worms; some members of this class are among the most destructive plant pests. (USDA Agricultural Research Service photo by Nancy Burelle.)*

APHIS PPQ regulatory programs are based on in-depth understanding of:

- Biology and host-parasite interactions for biological control agents and exotic pathogens, weeds, and insects to improve the efficacy and efficiency of eradication and management programs.
- Epidemiology of insect, weed, and nematode pests and diseases in order to design and implement effective strategies to mitigate their impact on crops and natural resources.
- Offshore pest and disease threats and the management programs to protect imports destined for the United States from becoming infested with plant pathogens or with exotic weed, insect, or nematode pests.
- New technologies that may be used to improve eradication and management programs.



*Giant salvinia, a foreign aquatic weed, can quickly form mats that cover the entire surface of waterways. Fortunately, the giant salvinia weevil can be used to control this pest biologically. The photograph in the foreground shows an infested waterway; the picture in the background is the same waterway a year after the weevil was introduced.*

## Contact Information

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*Tree-injection technology for delivery of systemic pesticides is widely used in the Asian longhorned beetle program and could find application in the emerald ash borer and glassy-winged sharpshooter programs, as well. Over the past 2 years, several new or modified devices have been developed to inject the active material into the vascular system of infested trees more effectively.*





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*Cover photo: A parasitic wasp attacks an aphid. (USDA Agricultural Research Service file photo by Scott Bauer.)*

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